# Jared Tippens

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## EDUCATION

**North Carolina State University**, *Raleigh, NC*
**August 2013 – May 2017**
Bachelor of Science, Mechanical Engineering
Cumulative GPA: 4.0/4.0

**Georgia Institute of Technology**, *Atlanta, GA*
**August 2017 – May 2019**
Master of Science, Mechanical Engineering
Cumulative GPA: 4.0/4.0

## PROFESSIONAL EXPERIENCE

**Mechanical Vacuum Systems Engineer 3** **October 2023 – Present**
**Mechanical Vacuum Systems Engineer 2** **March 2022 – October 2023**
US ITER: Oak Ridge National Laboratory, *Oak Ridge, TN*

- Facilitated the design and procurement of vacuum systems for the ITER nuclear fusion reactor located in Cadarache, France.
- Designed a high conductance, cryogenically cooled, and tritium-compatible, water-vapor trap to protect vacuum pumps.
- Managed the design, build, and delivery of custom ITER equipment as a Technical Project Officer from multiple suppliers.
- Performed heat transfer and flow analysis for custom equipment via computational fluid dynamics and hand calculations.
- Presented annually at the American Vacuum Society Conference about technical progress made on ITER's vacuum system.

**Mechanical Engineer 2** **June 2021 – February 2022**
**Mechanical Engineer 1** **June 2019 – June 2021**
Lawrence Livermore National Laboratory, *Livermore, CA*

- Designed, built, and tested mechanical subsystems for high-voltage, solid-state pulsers in application to a linear accelerator.
- Used Creo/Windchill to model parts, manage BOMs, and check drawings for large mechanical assemblies (>200 unique parts).
- Production Floor Manager for a $2 Million build occurring over a 3-month period for a team of ~20 technicians and engineers.
- Employed finite-element analysis and computational fluid dynamics to resolve various structural and thermal challenges.
- Held United States Department of Energy Q-Clearance (Top Secret Equivalent).

**Graduate Research** **August 2017 - May 2019**
ME Department, GT, *Atlanta, GA*

- Synthesized next-generation battery materials and characterized properties using SEM, XRD, and nano-indentation.
- Designed novel battery cell enclosures for *in-situ* testing of lithium-metal/solid-state electrolyte interfaces.
- Analyzed the internal stresses and fracture of battery components using x-ray tomography and image processing.
- Published "Visualizing chemomechanical degradation of a solid-state battery electrolyte" as first author in *ACS Energy Letters*.

**Lead Graduate Teaching Assistant** **February 2018 – May 2019**
**Graduate Teaching Assistant** **August 2017 – February 2018**
ME Department, GT, *Atlanta, GA*

- Managed/trained a team of seven teaching assistants to teach engineering content, run experiments, and grade reports.
- Taught 4th year ME students principles of heat transfer, electromechanical systems, experimental uncertainty, PID controls, etc.
- Set up and operated eleven engineering laboratory experiments for five semesters of an undergraduate engineering course.

**Undergraduate Research** **January 2015 – August 2017**
MAE Department, NCSU, *Raleigh, NC*

- Fabricated 2D nanostructures to enable a transparent solar harvesting window with high transmission and low reflection.
- Applied principles of optics and nanofabrication to create novel structures with energy applications.
- Published "Nanostructured antireflective in-plane solar harvester" as the first author in *Optics Express*.

**Research and Development Intern** **January 2017 – August 2017**
i2m, *Raleigh, NC*

- Designed/built an assembly line process making novel waste-water filters (Allocated $25,000 - completed $9,000 under budget).
- Drafted technical drawings according to GD&T standards and communicated with suppliers to machine parts for production.

**Manufacturing Engineering Intern** **May 2016 – August 2016**
Altec, *Creedmoor, NC*

- Supported the engineering team for the manufacturing of aerial lift trucks as they passed through the final assembly line.
- Documented assembly procedures for new truck builds that were being added to the high-volume manufacturing lines.

**Structural Stress Intern** **May 2015 – August 2015**

Honda Aircraft, *Greensboro, NC*

- Used Finite Element Analysis software to validate design of supporting structures for aircraft wings.
- Updated documentation for materials stress allowables to assist in FAA approval of first HondaJet aircraft (Approved Dec 2015).

**Undergraduate Physics Tutor** **August 2014 – December 2014**

Undergraduate Tutoring Center, *Raleigh, NC*

- Tutored students throughout a semester of undergraduate Engineering Physics 2 – a calculus based study of electricity, magnetism, optics, and modern physics.

## LEADERSHIP / AWARDS

**National Security Engineering Division Award for Outstanding Performance** **July 2021**

- Award from LLNL for exceptional performance regarding role as "Production Floor Manager"

**NC State University Engineers' Council: President** **April 2016 – April 2017**

- Led ~100 member organization in event planning for assisting undergraduate engineers academically and professionally.
- Oversaw distribution of funds to other engineering clubs at NC State University

**George W. Woodruff Fellowship** **August 2017 - May 2019**

**NSF Graduate Research Fellowship Recipient** **April 2018**

**Best Invited Poster – Electron, Ion and Photon Beam Technology and Nanofabrication Conference** **June 2016**

## PUBLICATIONS

**Visualizing chemomechanical degradation of a solid-state battery electrolyte** **June 2019**

ACS Energy Letters – Volume 4, Issue 6

- Presented a new correlation between the fracturing of a next generation ceramic electrolyte and a decline in battery performance.
- Imaged degradation of battery electrolyte throughout cycling in 3D with the use of computed x-ray tomography.

**Nanostructured antireflective in-plane solar harvester** **August 2017**

Optics Express – Volume 25, Issue 16

- Presented a new concept for an energy harvesting window, where a small percentage of light entering a glass surface is channeled to the window edges, where it can be collected by solar cells.
- Concept uses transparent nanostructures that act as both a diffraction grating and antireflective coating on the window.

## SKILLS / INTERESTS

**Technical Skills:** Heat Transfer, Mechanical Design, ANSYS, CFD, MATLAB, SOLIDWORKS, VacTran, GD&T, Microsoft Excel

**Interests:** Fusion, Renewable energy, Electric Vehicles, Vacuum Technology, Hiking, Camping, Reading.